

REMARKS

The Non-Final Office Action, mailed April 20, 2009, considered claims 1 – 21. Claims 1 – 21 were rejected under 35 U.S.C. § 102(b) as being anticipated by Doane (U.S. Pub. No. 2002/0138226), hereinafter *Doane*.

By this paper, claims 1, 4 – 6 & 16 have been amended; claims 2 – 3, 7, 10 – 15 & 17 – 19 have been canceled; and new claims 22 – 24 have been added; such that claims 1, 4 – 6, 8 – 9, 16, 20 & 22 – 24 remain pending, of which claim 1 (reciting a system), claim 16 (reciting a method), and claim 24 (reciting a system) are the only independent claims.

The pending claims are generally directed to embodiments for load testing a server using a per iteration model, wherein user characteristics for each request are dynamically randomly generated based on weightings defined in a data store containing a set of weighted user characteristics. This per iteration model of dynamic random request generation simulates a diverse population of users accessing the application without making upfront determinations of permutations of user characteristics for simulated users. Although individual requests are randomly dynamically generated, as the number of iterations increases the totality of requests statistically averages out to correspond to the percentages of user characteristics indicated in the weighted user characteristics.

Independent claim 1 recites a computer-implemented system that is configurable to place a controllable amount of stress on a server that is running an application in order to test load the server. The system includes a profile characteristic data store with a predefined set of weighted user characteristics. The system also includes one or more load simulators, each with a dynamic load adjuster component. The dynamic load adjustor component dynamically randomly generates user characteristics for a request involved in each iteration of the test load, according to percentage weightings defined in the predefined set of weighted user characteristics. The percentage weightings designate an overall desired distribution of user characteristics for the totality of requests. Whereas each request is generated randomly according to the weighted user characteristics (for example, using the weightings as probability inputs for the random generation process), as the number of iterations increases, user characteristics for the totality of requests statistically corresponds to the percentages in the predefined weightings.

Additionally, claim 1 recites a load coordinator component that dynamically evaluates the current distribution of the test load relative to a desired test load and adjusts the intensity and distribution of the requests accordingly. The load coordinator also increases requests per second to a predetermined level. Claim 1 also recites a performance monitor that monitors performance of the server as the rate of requests is increased, so the load capacity of the server can be determined.

Independent claim 16 is a computer-implemented method that is similar to claim 1 and which further defines aspects of the invention. The method includes assigning weights to user characteristics in a user profile. For each iteration of a test load, one or more requests are dynamically randomly generated according to percentage weightings in the weighted user characteristics, similarly as described above, but particularly as claimed. Further, in the method of claim 16, upon ending an iteration of the test load, the current test load is dynamically evaluated relative to a desired test load. The intensity and distribution of requests is adjusted by either creating a new request if the desired load is greater than the current load or reducing the current test load by one if the current load has risen above the desired load.

New independent claim 23 recites machine-implemented system embodiments which further define and narrow the claimed invention. The claimed system dynamically stresses a server by providing an adjustable rate of requests per second (RPS) to conduct stress testing, failure predictions, and capacity planning. The system comprises an execution engine that generates a scenario to load the server via a plurality of requests. The plurality of requests are dynamically adjusted based on a user profile having weighted characteristics, including the browser type of a user. User characteristics are distributed as a percentage of total requests. The execution engine includes a data store containing the user profile, a scheduler, a queueing mechanism, a sending component, and a feedback loop. Upon receiving a signal input from the scheduler, the queueing mechanism retrieves request data from the data store, randomly based on the weighted user characteristics, and places the request data in a queue. The queueing mechanism sorts the requests within the queue according to a predetermined time function. The sending component, upon receiving an input from the scheduler that is based on a predetermined desired RPS rate, sends a sorted request from the queue. The feedback loop provides closed loop control to enable the system to provide a continual and sustained rate of requests. The feedback loop, based on a difference between a target RPS and an actual RPS, provides an input to the scheduler, thereby controlling the RPS of the system.

As discussed above, the prior claim versions were rejected in light of *Doane*, a patent application for a software load tester that includes remote access connection, account recording, and load test management tools. *Doane* describes a “User-Scenario Recording Module”, for creating user scenarios based on a logged-in user’s interactions with a website and corresponding User-Scenario Editing, Playback, and Delete Modules. (*Doane*, Figs. 4 – 6.) *Doane* also describes a “Software Test Design Module” which allows a user to design a site test by selecting arrival rates of browsing activities, “weighting the types of simulated users produced by the load software,” selecting distributions of user-tolerance levels, etc. (¶ 0063). The user can determine the maximum load level and the duration of test. (¶ 0064) *Doane* also describes a corresponding “Test Scenario Manager Module” which queries a user for the number of users, ramp up period, ramp up model rate, and user weights for user scenarios. (Fig. 7, ¶ 0066).

Applicant respectfully submits that the independent claims, particularly as amended, and all of the corresponding dependent claims are distinguished from and allowable over *Doane*. For example, *Doane* fails to teach, among other things, one or more load simulators, interfaced to a data store containing a predefined set of weighted user characteristics, where the load simulators both dynamically and randomly generate user characteristics for a request according to percentage weightings in the weighted user characteristics, particularly as claimed. *Doane* fails to teach any such method for deploying test scenarios that are described therein. Whereas *Doane* teaches setting up a test scenario with various parameters, including applying weights to user scenarios including user types, tolerance, connection speeds, and browser types, (Fig. 7 & ¶¶ 0066-0067)), *Doane* does not teach per-iteration, request based load testing of a server, where user characteristics for each request are dynamically randomly generated according to predefined weightings, particularly as claimed in the present invention.

With respect to obviousness, it is further noted that it would not be obvious to a person of skill in the art at the time of invention who has the teachings of *Doane*—including the mechanisms for managing and creating a Test Scenario with weighted user scenarios that are described therein—to apply a “test scenario” to a per iteration system or method with random dynamic generation of user characteristics for requests, as claimed in the present invention. Rather, the person of skill in the art would find that *Doane* failed to teach or suggest any means of executing software load testing that is analogous to techniques described and claimed in the present invention.

Doane also fails to teach or suggest dynamic evaluation, upon ending an iteration of a test load, of the current test load relative to a desired test load, particularly as claimed, *e.g.*, in independent method claim 16. Further, *Doane* fails to teach or suggest adjusting the intensity and distribution of the requests based on such an evaluation, and either creating a new request if the desired load is greater than the current load, or reducing the current test load by one if the current load is above the desired load, particularly as claimed.

Additionally, *Doane* fails to teach or suggest the system described in new independent claim 24, particularly, a system that stresses a server by providing an adjustable rate of requests per second (RPS), including an execution engine that generates a scenario to load the server via a plurality of requests that are dynamically adjusted based on weighted characteristics in a user profile, particularly as claimed. *Doane* further fails to describe such a system that includes a data store containing the weighted user characteristics, a scheduler, a queueing mechanism, a sending component and a feedback loop, with their corresponding functionality and limitations as claimed.

In view of the foregoing, Applicant respectfully submits that all the rejections to the independent claims are now moot and that the independent claims are now allowable over the cited art, such that any of the remaining rejections and assertions made, particularly with respect to all of the dependent claims, do not need to be addressed individually at this time. It will be appreciated, however, that this should not be construed as Applicant acquiescing to any of the purported teachings or assertions made in the last action regarding the cited art or the pending application, including any official notice, and particularly with regard to the dependent claims.¹ In fact, the amended dependent claims and new dependent claims serve to further refine the scope of the invention and provide for additional embodiments that are not taught by the prior art.

¹ Instead, Applicant reserves the right to challenge any of the purported teachings or assertions made in the last action at any appropriate time in the future, should the need arise. Furthermore, to the extent that the Examiner has relied on any Official Notice, explicitly or implicitly, Applicant specifically requests that the Examiner provide references supporting any official notice taken. Furthermore, although the prior art status of the cited art is not being challenged at this time, Applicant reserves the right to challenge the prior art status of the cited art at any appropriate time, should it arise. Accordingly, any arguments and amendments made herein should not be construed as acquiescing to any prior art status of the cited art.

In the event that the Examiner finds remaining impediment to a prompt allowance of this application that may be clarified through a telephone interview, the Examiner is requested to contact the undersigned attorney at 801-533-9800.

Dated this 20th day of July, 2009.

Respectfully submitted,



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